

REMARKS

Applicant respectfully requests reconsideration in view of the following comments.

The action rejects claims 1 to 3 and 6 to 10 under 35 U.S.C. § 102 (b) as being anticipated by Talieh US Pat. No. 5,650,039. Talieh discloses the use of opposing clockwise and counterclockwise arcuate grooves that terminate inward from the peripheral edge. These grooves, however, all start and terminate at the same radial location. Talieh fails to disclose two sets of grooves with a first set having a first end starting in the central region and a second set having a first end starting in the polishing region. In addition, the claims require the second end of the second plurality of grooves to have a location radially outward of the second end of the first plurality of grooves. This spacing can force slurry to "jump" from the first plurality of grooves to a second plurality of grooves to improve slurry utilization. Furthermore, the Talieh reference teaches away from the claimed invention by teaching grooves that all start and terminate in the same radial location. Thus, since Talieh fails to disclose a first set of grooves with first ends starting in each of the central region in combination with a second set of grooves with first ends starting in the polishing region or the second end of the second set of grooves spaced outwardly from the second end of the first set of grooves and the references teach away by disclosing grooves that all start and terminate in the same radial location the Talieh fails to disclose or suggest the claimed invention.

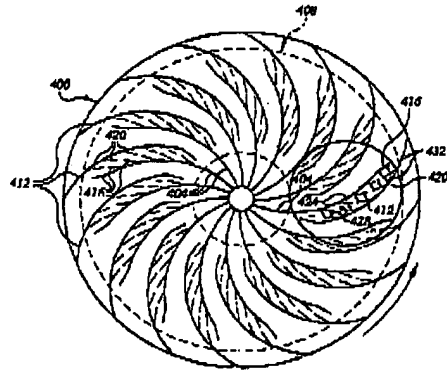
The action rejects claims 1 to 4 and 6 to 10 under 35 U.S.C. § 103 (a) as being obvious in over Robinson et al. US Pat. No. 5,990,012 ("Robinson") in view of Rubino et al., US Pat. No. 5,527,215 ("Rubino"). In particular, the action relied upon Robinson's Figure 7 to disclose the claimed invention, except for the first plurality of grooves having ends that terminate in the polishing region spaced radially inward from the peripheral edge. Rubino does disclose grooves

that terminate radially inward from the outer peripheral edge. But the combined references fail to disclose two sets of grooves with a first set having a first end starting in the central region and a second set having a first end starting in the polishing region. In addition, the claims require the second end of the second plurality of grooves to have a location radially outward of the second end of the first plurality of grooves. This spacing can force slurry to "jump" from the first plurality of grooves to a second plurality of grooves to improve slurry utilization. Furthermore, the Robinson and Rubino references teach away from the claimed invention by teaching grooves that all terminate in the same radial location. Thus, since the combined references fail to disclose a first set of grooves with first ends starting in each of the central region in combination with a second set of grooves with first ends starting in the polishing region or the second end of the second set of grooves spaced outwardly from the second end of the first set of grooves and the references teach away by disclosing grooves that all terminate in the same radial location the combined references fail to disclose or suggest the claimed invention.

The action rejected claim 5 under 35 U.S.C. § 103 (a) as being obvious in view of Talieh US or Robinson et al. as modified by Rubino et al. in view of Burke et al., US Pat. No. 5,645,469. The action relied upon Robinson's Figure 7 to disclose the claimed invention, except for the first plurality of grooves having ends that terminate in the polishing region spaced radially inward from the outer peripheral edge. Talieh and Rubino do disclose grooves that terminate radially inward from the outer peripheral edge. But all these references fail to teach the second end of the second plurality of grooves to have a location radially outward of the second end of the first plurality of grooves. This spacing can force slurry to "jump" from the first plurality of grooves to a second plurality of grooves to improve slurry utilization. Furthermore, the Robinson, Talieh and Rubino references teach away from the claimed invention by teaching grooves that all

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terminate in the same radial location. Additionally, Burke does not disclose or suggest the claimed branching distribution grooves with collection grooves. For example, the Burke reference does not disclose branched distribution grooves 416 with branched collection grooves 420. The Burke reference simply teaches branching with circular grooves and does not teach using branch grooves to distribute polishing fluid to a polishing region and collecting polishing fluid from the polishing region with a second set of branch grooves. Thus, since the combined references fail to disclose the second end of the second set of grooves spaced outwardly from the second end of the first set of grooves, the references teach away by disclosing grooves that all terminate in the same radial location, and Burke fails to disclose or suggest the branching and collecting grooves defined by claim 5, Applicant respectfully submits that claim 5 is patentable over the combined references.



The action rejected claims 1 to 4 and 6 to 9 under the judicially created doctrine of double patenting in view of claims 1 to 10 of Muldowney, 6,843,711 ("the '711 patent"). In particular the rejection relies upon the '711 patent anticipating the claimed invention. The '711 patent teaches calculating the pad's critical radius as follows:

$$R_{critical} = \frac{S}{1 + \frac{\Omega_{pad}}{\Omega_{wafer}}}$$

and then adjusting the location of a groove boundary between different groove types. The pending claims require 1) a first plurality of grooves having a first end in the central region and a second end located in the polishing region, and the second end being radially inward of the outer

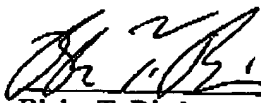
peripheral edge and radially outward of its rotational axis; and 2) a second plurality of grooves spaced from the first plurality of grooves that terminate in the outer peripheral edge or radially outward from the polishing region. These claims do not extend coverage of the '711 patent related to calculating a pad's critical radius for a groove transition. The '711 patent does not appear to disclose Applicant's first and second set of grooves. Furthermore, since the claimed discontinuous first set and second set of grooves can improve slurry utilization during chemical mechanical polishing of semiconductor substrates, they are patentably distinct from the '711 patent. Thus, since the claims of the '711 patent does not anticipate or suggest the amended claims, the claims of the subject application are patentably distinct from the '711 patent; and Applicant respectfully submits that the double patenting rejection is inappropriate for claims 1 to 10, as amended.

The action rejected claim 5 under the judicially created doctrine of obviousness-type double patenting in view of claims 1 to 10 of the '711 patent and Burke. In particular the rejection relied on Burke disclosing a plurality of branching grooves and the '711 patent anticipating the other limitations of claim 5. Burke does not disclose a plurality of distribution with collection branching grooves. In addition, as discussed above, the claimed subject matter of the present invention is not anticipated or suggested by the '711 patent. Applicant, therefore, respectfully submits that claim 5 is patentably distinct over the claims of the '711 patent in view of Burke under the judicially created doctrine of obviousness-type double patenting.

Applicant believes that the amended application is in condition for allowance and respectfully requests reconsideration. Please call Applicant's Attorney at (302) 283-2136 if a call would expedite prosecution.

Respectfully submitted,

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Date



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